

## **EXHIBIT 18**



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## REPORT OF ANALYSIS OF CRAYONS FOR THE PRESENCE OF ASBESTOS

A number of crayons were analyzed at the OSHA SLTC to determine whether or not asbestos was present. The crayons were ashed to remove any organic material, then analyzed by phase-polar illumination (OSHA method ID 191). A particle count estimate of percentage was made to determine the fiber content. In addition, gross scans of the fibers found in the Crayola Orchid and Prang Periwinkle color crayons were examined by transmission electron microscopy with x-ray energy analysis to identify the fibers noted in the light microscope.

No fibers of any asbestos mineral as defined in 29 CFR 1910.1001 were found to be present in any of the samples analyzed. There were, however asbestiform fibers of a mineraloid intermediate in composition between talc and anthophyllite. In addition, cleavage fragment fibers of non-asbestiform tremolite were found to be present.

### Discussion:

A departure from ID-191 was made for this particular analysis, the material was immersed in a liquid with a measured index of refraction 1.592 at 23°C. This was chosen because it was closest to the lowest reported index of refraction for anthophyllite. (Deer, Howie and Zussman, **Rock Forming Minerals**, Vol 2, p 211, Longman, Great Britain, 1974). This is used as a go / no-go decision as to whether there are fibers of anthophyllite or tremolite present or not. If fibers of anthophyllite or tremolite are present, they will demonstrate colors indicating indices of refraction above 1.592. The samples were also examined in the liquid 1.550 to determine whether or not chrysotile was present.

Weighed portions of crayons were ashed at 500°C for 24 hours to remove all organic matter. Finely dispersed preparations of particulate were made of the residue in liquids 1.592 and 1.550 liquids. The preparations were examined generally for the presence of asbestos minerals. None of the samples demonstrated the presence of asbestos. However, asbestiform fibers were observed and quantified by particle count as follows. The samples were imaged in dispersion stain at approximately 200x magnification. Particles greater than about 5µm and greater were counted and divided into fibers with index of refraction less than 1.592 and total particles. This resulted in the data represented in the following table.

Crayon color / manufacturer / CPSC number (if present)	Percent asbestos fiber present	Percent asbestiform fiber present <i>of residue after ashing</i>	Fraction residue after ashing	Percent fiber
Crayola White	none detected	none detected	0.186	none detected
Crayola Orchid 1	none detected	3.15%	0.244	0.77%
Prang Periwinkle 1	none detected	8.74%	0.141	1.23%
Crayola Blue 525-1-1	none detected	6.14%	0.212	1.30%
Crayola Green 525-1-3	none detected	4.42%	0.200	0.88.%
Rose Art Blue 525-3-1	none detected	none detected	0.00516	none detected
Rose Art Orange 525-4-2	none detected	none detected	0.0002	none detected
Crayola Orchid 2 525-9-1	none detected	4.75%	0.201	0.95%
Prang Yellow 530-1	none detected	4.06%	0.1613	0.065%
Prang Yellow 530-2	none detected	5.82%	0.2041	1.19%
Crayola Washable Blue	none detected	none detected	0.145	none detected

Preparations were made of the residue of Crayola Orchid and Prang Periwinkle. Two TEM grids of each were examined to find any asbestiform fibers. Such fibers were determined to be present. All diffraction patterns were examined in situ. All were noted to have talc-like appearance excluding them from identification as anthophyllite. Chemistry determination By EDX was also made for these fibers and found to contain Si, Mg, with traces of Fe and Ca. This is consistent with anthophyllite or intermediate (transitional) mineral fibers. The Mg/Si ratio was suggestive that the fibers examined were intermediate in character between talc and anthophyllite tending toward anthophyllite. However, none of the fibers examined had chemistry sufficiently close to anthophyllite to be included in the definition for anthophyllite.